GPS MOBILE TRACKER

USER MANUAL

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1. GENERAL INSTRUCTION

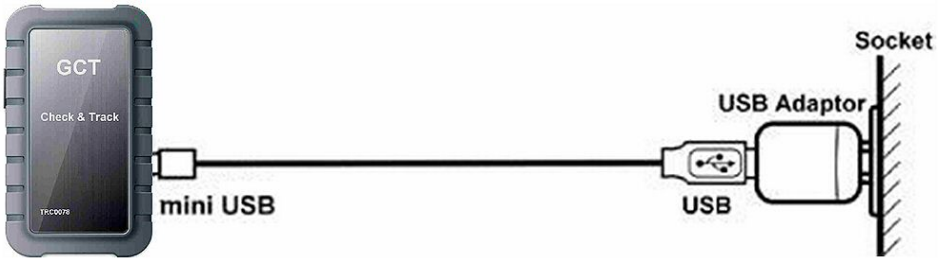
1.1 Precautions before Installation

1. Check if all the parts are included.
2. Prepare a SIM card for GSM communication.
3. Use a mobile phone to confirm that a PIN code has not been set on the SIM card, and that it can dial out and receive telephone calls without problem.
4. Before installing the SIM card, make sure to cut off all power from the Tracker unit.

1.2 Battery Charging

With the supplied AC-DC Charger the battery can be charged. Fully charge the battery for at least 4 hours before using it. Charge current is about 200 mA

Method 1: USB connects to the USB AC/DC adapter



Method 2: USB connects to the USB of High Power USB Hub.

1.3 Mounting of Unit and release out of mounting plate holder

Screw the mounting plate with the supplied screw to the desired mounting place if needed.

Bend the lip on the corner with your finger nail or use a screw driver to bend the lip a bit outwards. See picture.

While bending the lip outwards pul the Tracker out of the mounting plate.

To insert the unit back, just click it back in the mounting plate.

1.4 Install SIM Card and battery:

1. Remove the back cover of your tracker, as illustrated above.
2. Unscrew the screw and push the battery cover (with an ellipse indent) rightward to remove it. (Fig.1)
3. Push the top of the SIM card holder as indicated by the green arrow. (Fig.2)

Fig. 1

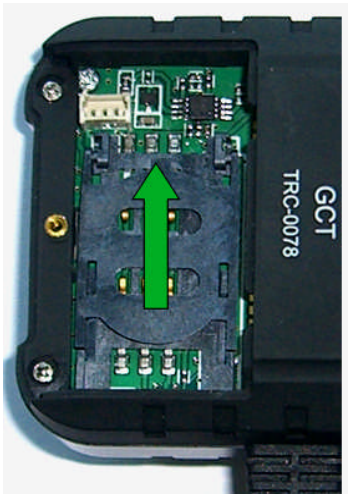


Fig. 2

4. Move the holder upwards as indicated by the red arrow. (Fig.3)
5. Insert the SIM card by sliding it into the card holder slot, with the chip module facing to the connectors, as shown in the picture (Fig. 4)

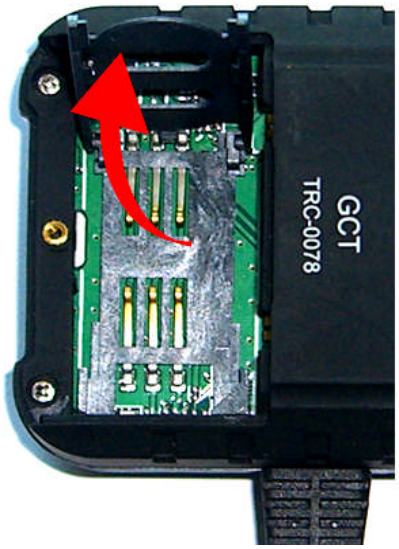


Fig. 3

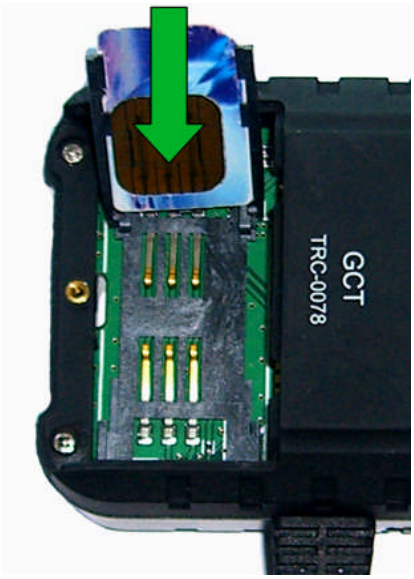


Fig. 4

6. Flip down the holder top. Slide the holder top downward and let it snap in completely. (Fig. 5)
7. Insert the battery as indicated in (Fig 6)

Fig. 5

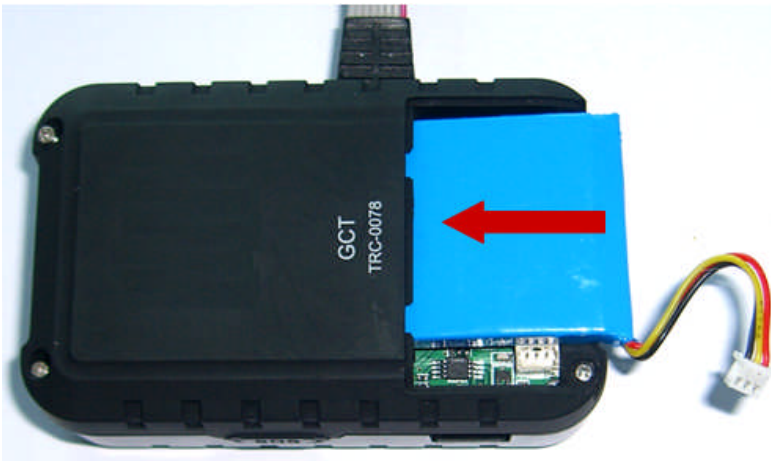


Fig. 6

8. Carefully connect the battery wires with the connector as indicated (Fig. 7)
9. Replace the battery cover (blue arrow) and lock with the screw (green arrow) (Fig. 8)

Fig. 7

Fig. 8

2. General Description

The Tracker can be operated by standard SMS messages, or via GPRS. Via an SMS, the GPS position data can be requested and will be sent back to the requested party's mobile phone via an SMS. The number and the time sequence of these GPS data blocks and other parameters are fully programmable by an instruction SMS.

2.1 Data Format of SMS Command Messages:

The data has to comply with an exact format able to be read by the tracker module.
The format is**:** **[Password]-[mode]-[Sub-Group1]-[Sub-Group2]**

Password :	Factory default password is **1234**
Mode :	Select the operating mode. This can be a Direct command, Set-up command, or a Recall command.
Sub-Group1 :	ON / OFF commands; or Set-up (Initialization) or Request group.
Sub-Group2 :	Parameters of the set-up group. Information like Telephone numbers, setting string of T and C mode, data format for GPS information (DMS,Google,Ddec) etc.

2.2 SOS function:

When the SOS button is pressed, the position data will be sent to a preset phone number(s). Maximum 8 numbers can be stored which all will be notified if a SOS situation occurs. These phone numbers can be set via a SMS message sent to the tracker unit.

2.3 Line-In and Line-Out: (Only applicable for TRC0078)

This tracker has 4 Line-inputs, of which 2 can be used to detect switch positions. The other 2 can be used for relative values such as temperature or fuel level. Via the Out-put lines remote equipment can be activated like an Alarm or immobilizer

2.4 Geo-Fence feature:

This tracker has a geo-fence feature. If activated, the instructed party will receive a SMS when the Tracker unit exits set boundary area.

2.5 Car Battery connection: (TRC0078 only)

This tracker has a built-in DC-DC converter to allow to be connected to the 12-24V car battery. This circuitry is special design to meet the ISO 7637 requirements

2.6 Battery Low alert:

When the Internal battery is nearly empty and reaches a certain voltage level the charge LED starts blinking and later an SMS message will be sent to indicate "Battery Low"

2.7 Stationary or on the move: (TRE0078 only)

In "Tracking" mode; if the position data equals the 4 previous transmitted positions (to be retrieved from SMS 4), the "Tracking" mode will stop, a SMS message will be sent with extra info in the SMS message "Stationary Position".

2.8 Motion sensor:

The tracker has a motion sensor and when switched ON the tracker will automatically switch to Track Mode when acceleration is detected twice within 30 sec to 1 minute.

2.9 Extra GPS and GSM antenna connections: (TRC0078 only)

The tracker has extra antenna sockets to allow connection to external antennas. Internal circuitry automatic detects and delivers the power supply to the external antenna (GPS).

2.10 No GPS data:

If no GPS data can be retrieved from the GPS receiver the unit will transmit the current GSM tower location "Node" information.

2.11 Recall history data: (TRE0078 only)

A total of 8 previously transmitted SMS messages which contain position data can be recalled via SMS request.

2.12 Last valid GPS position data:

The "LAST" valid GPS position data can be recalled via SMS message.

3. Operation and Command Modes :

3.1 Direct Commands

3.1.1 Single GPS request mode [S]

Command string: [Security code]-[S] **example: 1234-S**

In the single GPS request mode only the present GPS information will be sent or if no GPS data is available the GSM "node" info will be sent to requested phone number via SMS.

3.1.2 Tracking mode [T]

Command string: [Security code]-[T] **example: 1234-T**

The Tracking mode is intended to regularly check the position of the unit automatically where regular update of position is required, for example, when tracking a stolen vehicle. The SMS information includes:
GPS coordinates, GPS date and GPS time.

3.1.3 LAST valid GPS coordinates [LAST]

Command string: [Security code]-[LAST] **example: 1234-LAST**

Incase no GPS data can be transmitted (No satellite reception) the GSM cell phone tower "Node" information will be sent. With the "LAST" command however, it is possible to retrieve the last valid GPS coordinates which could possibly still be more accurate than the "Node" information.

3.2 ON / OFF Commands for Modes & Functions

3.2.1 Motion sensor mode [M]

Command string: [Security code]-[M]-[on] **example: 1234-M-on**

When required, the motion sensor can be switched ON. It will then automatically set the Tracker into the Track-Mode if movement is detected twice within 30sec-1minute. The Motion sensor can be switched OFF again via command:

[Security code]-[M]-[off]

3.2.2 Geo-Fence mode [GEO]

Command string: [Security code]-[GEO]-[on] **example: 1234-GEO-on**

The Geo-fence feature allows the user to set a virtual boundary. The tracker will inform the user when leaving this boundary. The radius of this boundary (circle) is set in default to 100 meters. The Geo-Fence mode van be switched off via command:

[Security code]-[GEO]-[off]

3.2.3 Power Saving mode [PS]

Command string: [Security code]-[PS]-[off] **example: 1234-PS-off**

The Power Save mode (PS) allows extended operation of the tracker without recharging the battery. Battery life however depends on the uses of the various functions. The default setting for Power Save is OFF. If Power Save is switched ON, and the unit is only powered from the internal battery, it will be switched off for the user-defined ("C") periods and will not respond to new SMS commands in those time intervals.

The Power Save mode can be switched on with command:

[Security code]-[PS]-[on]

3.2.4 Line-Output [LO] (TRC0078 only)

Command string: [Security code]-[Lox]-[on] **example: 1234-LOX-on (X =1 or 2)**

To activate the Line-Out, the above command has to be sent. Without (**X**) it will activate both output lines. They can be switched off with command:

[Security code]-[LOx]-[off]

3.2.5 TRACK mode [T]

Command string: [Security code]-[T] **example: 1234-T**

To switch on the Track mode when you automatically want regular position updates

The Track mode can be switched OFF with command:

[Security code]-[T]-[off] **example: 1234-T-off**

4. Initialization / Programming mode (I)

4.1 Password (Security code)

A password is required to operate the Tracker properly and allow the tracker to accept the SMS commands. The factory default password is "**1234**". It is important to change the password to one of your own choice (max 8 alpha-numeric characters). **Do not forget your password**, because it can only be re-set again to the default by the factory. To change this number the following command has to be sent via SMS:

Password-I-SEC-new (α-numeric) security number

For example, if you want to change the password from the default "1234" to "4321", then you will have send the following SMS to the device: **1234-I-Sec-4321**

A SMS will be sent to the caller ID to reconfirm the new setting

4.2 GPS DATA FORMAT

The default GPS data format is in Degrees minutes and seconds. Another format can be selected, like a data format in Degrees decimal. To change the default setting the following command string has to be sent via SMS:

Password-I-GPS-DMS	means Data in Degrees, minutes and seconds
Password-I-GPS-Google	means URL link for Google Maps
Password-I-GPS-Ddec	means Data in Degrees, decimal
Password-I-GPS-NMEA-xxxxx	means a complete line of the NMEA data.

Available lines for **xxxxx** are:

GPGGA = Global position Fix data
GPRMC = Recommended minimum data sentence
GPGSA = Overall satellite status data.

A SMS will be sent to the caller ID to reconfirm the new setting

4.3 TRACKING MODE

In Tracking mode the tracker will send the GPS information every 3 minutes (Default setting is T=0003) and will repeat this 20 times (R=020). Furthermore the time between checking for new incoming SMS messages is 10 min (C=010). Track-Mode is normally used, for example, in a chase situation when a car is stolen and continuous tracking of the route is important. To enter new time **(T)** number of repeats **(R)** and SMS check time **(C)** the following command has to be sent:

Password-I-TRK-TxxxxRxxxCxxx **Example: 1234-I-TRK-T0003R020C010**

A SMS will be sent to the caller ID to reconfirm the new setting.

NOTE: The time to check for new incoming SMS messages (C) applies when the unit is operating from the internal battery only, and Power save mode is active, with no external power connected to it. If connected to a car battery (for example), then the unit will be permanently ready to receive a new incoming SMS message, thus the "C" time will not apply.

Restrictions: SMS checks C within the time T x R will only be carried out if T>2C
See NOTE at the end of this section for expanded information.

4.4 TEL MODE (Overriding caller ID)

The Tracker can be instructed to send the SMS messages to other telephone number than the caller ID telephone number of the mobile phone from which the original set-up information or request for information was sent. This can be useful in, for example, a roaming situation where the callers ID is not always correctly presented or where the caller is running out of battery power and would like to switch over to another mobile phone. The tracker can be instructed to override the default mode to SMS back to a specified telephone number by sending the following string:

Password-I-TEL-xxxxxxxxxxx **xxxxxxxxxxx= <+><country code><phone number>**

Any subsequent instruction sent to the tracker will override this setting and return to use the caller ID telephone number, the only exception is the command: **Password-R-TEL**

4.5 SOS PHONE NUMBERS

To enter SOS phone number(s)(max 8) the following string has to be sent via SMS:

Password-I-SOS#-xxxxxxxxx **xxxxxxxxx= IDD phone number max 16 digits incl. +**
SOS**1** is the 1st SOS IDD number, SOS**2** is 2nd etc. A SMS will be sent to the caller ID to reconfirm each new setting and to the new SOS number a SMS will be sent with text info.

"You will receive GPS coordinates in case of emergency"
To erase a phone number, just send: **Password-I-SOS#-0**

4.6 GEOFENCE MODE

The geofence mode creates a virtual circular boundary around the unit's location. The radius of this circle can be set by the following command:

Password-I-GEOxx **xx** is the radius x 100m. (For TRE0078 **xxx**)

For example, "GEO01", means 100m. This is also the default radius.
(Or GEO001 for TRE0078 which has a 3 digit input)
A confirmation SMS will be sent to indicate the settings.

4.7 DEFAULT MODE

The unit can be set to all the original default settings, except the password, with command:

Password-I-D

A SMS will be sent to the caller ID to reconfirm the default settings.

5. Recall mode (To review system data)

5.1 GPS DATA FORMAT

A command can be sent to the tracker to ask for the instructed GPS data format information. Command for this info request is:

Password-R-GPS

A SMS will be sent with GPS data (DMS, Ddec or other)

5.2 TRACKING MODE Settings

A command can be sent to the tracker to reveal the last set "Track" Mode parameters **T** , **R** and **C**. Command structure of the "Track" mode settings request is:

Password-R-TRK

A SMS will be sent to indicate the set parameters of time between GPS transmission (T), number of repeats (R) and SMS check time (C). Example: **TRK :T0003R020C010**

5.3 TEL MODE (Overriding caller ID)

Request for telephone number where SMS messages will be sent. This can be the caller ID or the new instructed Phone number where the GPS data has to be sent to. Command structure for "TEL" request is: **Password-R-TEL**

5.4 GEOFENCE Setting

Request for Radius of Geofence circle. Command structure of the "Geo" request is:

Password-R-GEO

A SMS will be sent to indicate the Geo-fence radius in meters.

5.5 SOS PHONE NUMBERS

A command can be sent to the tracker to reveal the last set SOS phone numbers. Command structure of the SOS phone numbers request is:

Password-R-SOSx

Where **X** is position number of the stored SOS phone number.
SOS1 means phone number of SOS1. **SOS2** means phone number of SOS2, and so on.

5.6 MOTION SENSOR Setting

To find out if the Motion Sensor is ON or OFF, the following command can be sent:

Password-R-M

A SMS will be sent to reveal if the Motion sensor is switched ON, or OFF.

6. Geofence

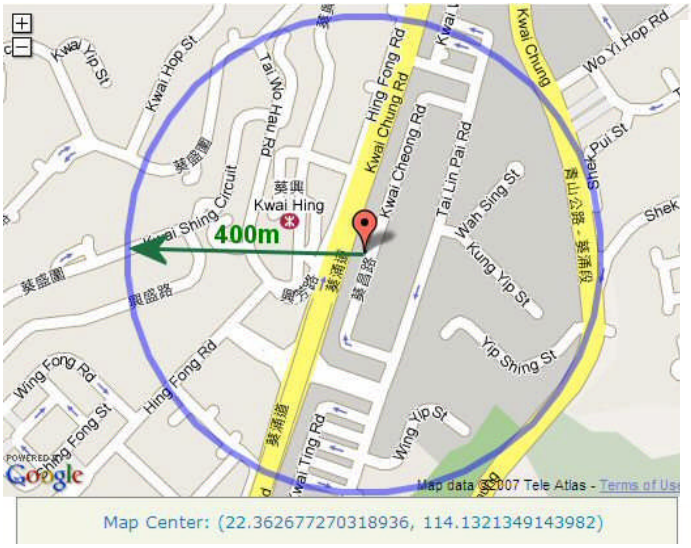
Goefence is a virtual circular boundary of which the radius can be set by SMS command. This feature allows the user to observe if the Tracker will remain within a set boundary (area) or if it will leave this area. This can be important for asset or vehicle monitoring with limited allowed access within a specified region. Also useful, for example, for the elderly with dementia problems when living in an elderly home.

When the Geofence is switched ON it will take the tracker's position at that moment to draw a virtual circle with a specified radius. In default this radius is 100 meter.
The command to switch the Geofence On is:

Password-GEO-ON **example: 1234-GEO-ON** or
Password-GEO-OFF **example: 1234-GEO-OFF** to switch the geofence off.

To set a different boundary for example with radius of 400 m:

Password-I-GEO04



To check the Geofence setting, a SMS message has to be sent to the tracker as follows:

Password-R-GEO

The tracker will send SMS with the requested information.

Example:
"GEOFENCE is set to 400m"

DEFAULT SETTING:
When no Geofence range is set the tracker will use the default setting of 100 meter. Any other range can be set via the following command:

[security code]-[I]-[GEOXX] **example 1234-I-GEO07**

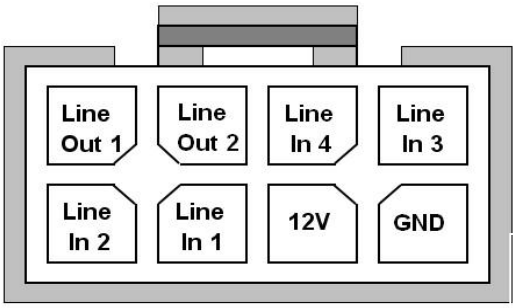
Where **XX** is a 2-digit figure and represents the radius of the circle in multiples of 100 meter. Example GEO07 = 700 meters, or Geo10 = 1000 meters.

STOPPING GEOFENCE:
To turn off the Geofence mode, the following command (SMS message) has to be sent to the Tracker:

[security code]-[GEO]-[off] **example 1234-GEO-off**

7. Line-Inputs. (TRC0078 only)

The TRC0078 is equipped with an external connector for external power connections (like a car battery) and Line-In/Line-out terminals to connect to remote systems and/or switches.



View at the Pins

The TRC0078 has a connector with 8 pin terminals.

- 4 pins for Inputs
- 2 pins for Outputs
- 1 pin for Car battery voltage (+) (+12-24V)
- 1 pin for ground

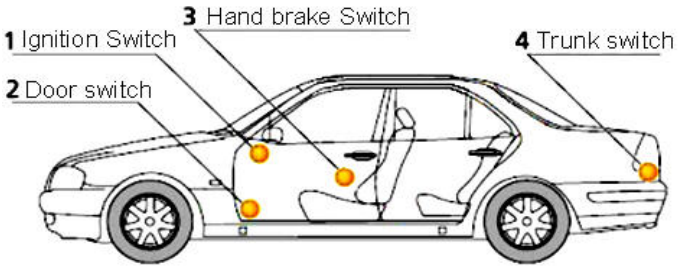
Black =ground	Orange= Line-In3
Red =+12-24V	Yellow= Line-In4
Brown=Line-In1	Blue = Line-Out2
White =Line-In2	Green=Line-Out1

The 4 Line-In terminals can detect or register events which will trigger the Tracker to send a SMS "Alert" message, or it can indicate a voltage level as % of a reference voltage 3.3V The Line-In terminals are set for the following registration:

7.1 "ABSOLUTE": Line-In 1 and Line-In 2 are set to register ABSOLUTE events.

Line-Input 1 & 2 are set to send an "Alert" message when the input voltage changes from 0V to +Vb or from +Vb to 0V

Input 1 and 2 can be used, for example, to detect a switch function like a door switch, ignition switch, handbrake switch or trunk switch.



Possible switch connections

In the event when one of these switches is activated the Tracker will be triggered and will automatically send a SMS "Alert" message. Depending on which switch is activated it will indicate in the SMS the switch number.

For example if the Brake switch is connected to line-input 2, the SMS will indicate the number. Example: "Alert 2"

7.2 "RELATIVE": Line-In 3 and 4 are set to register RELATIVE events.

Both inputs measure the input voltage via an A/D converter and register the voltage level as % of a reference voltage of 3.3V.

In the Relative mode it is possible to measure fluctuating parameters and the delta of these fluctuations, like Temperature or Fuel Levels. If for example the input voltage is 1.32 volt the SMS message will indicate: Li3= 40%.

The Line-Input status is indicated in each GPS coordinate message.

8. Line-Outputs (TRC0078 only)

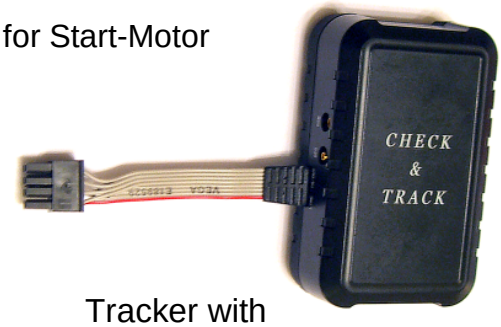
The TRC0078 has 2 line-Out terminals which can be used to remotely control systems.

Electrical specification of Output terminals:
Max. Output voltage: 24V
Max. Sink Current: <500mA

Two Independent controllable Outputs can be used to control the drive circuitry of a number of remote systems like:

Control immobilizer circuit for Start-Motor

Control Alarm System



Tracker with
2 Line-Out Control lines

8.1 Commands related to the Output Lines:

ACTIVATE / DEACTIVATE:

To activate the Line-Outputs the following command has to be sent:

[security code]-[LOX]-[ON] **(Where "X" = 1 or 2)**

An SMS will be sent to confirm the setting: **"LO1 is active"** or **"Lo2 is active"**

[security code]-[LOX]-[OFF] **(Where "X" = 1 or 2)**

A reply SMS confirms the setting: **"LO1 is not active"** or **"LO2 is not active"**

STATUS Information of Line-Out:

The status of the Line-outputs is indicated in every GSM coordinate message
The Tracker will send the status as follows:

"LO1-ON" or "LO1-OFF"
"LO2-ON" or "LO2-OFF"

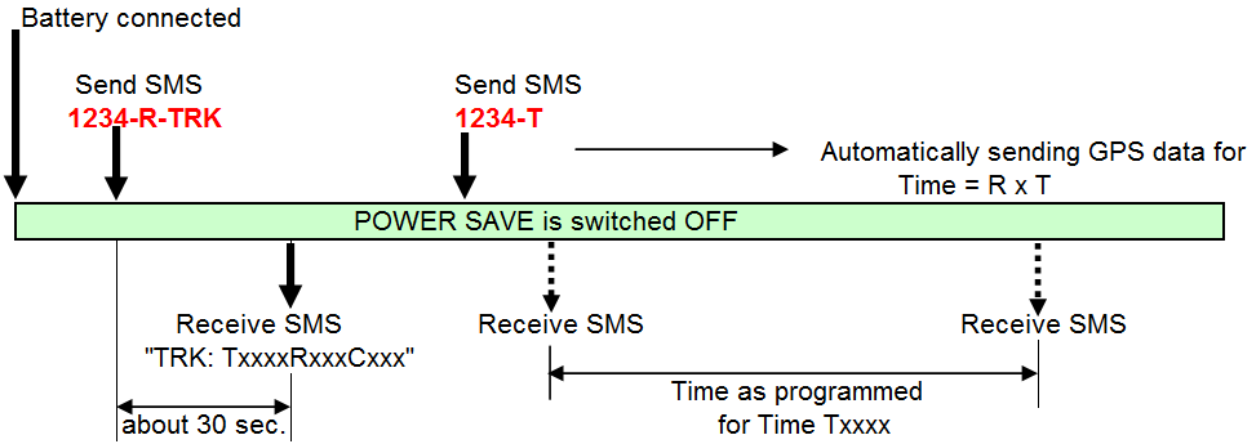
9. Timing criteria

The Default timing programming settings are: **T0003R020C010**

The meaning of these parameters are as follows:

T = Time between each SMS message with GPS coordinates that the device will send when it is in the “Tracking” mode.
R = Number of times the GPS position SMS messages is sent while in “Tracking” mode.
C = This is the time delay between Checking for any new SMS messages when operating from the internal battery only, and in Power Save mode.

9.1 Operating from Internal battery only, with No external power connected. Power Save Mode-OFF:

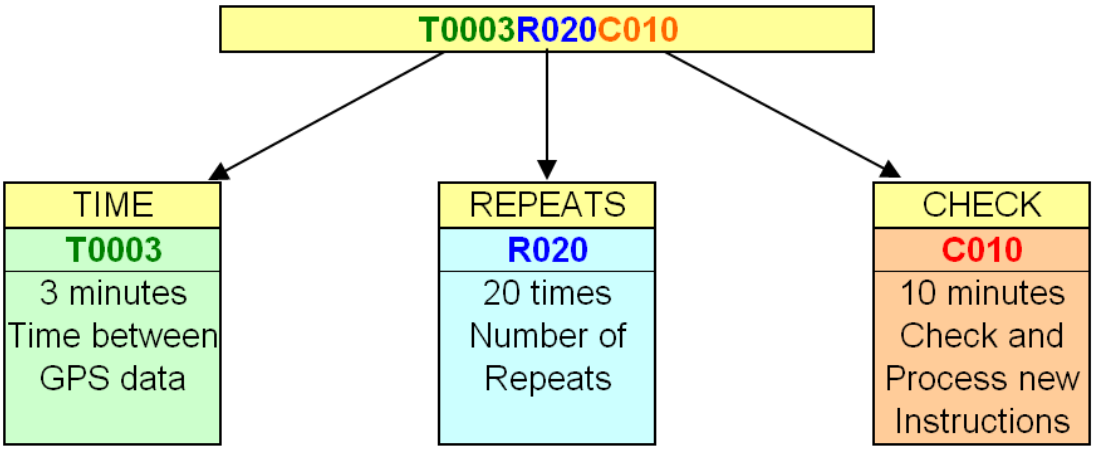


If Power saving mode is switched **OFF** the SMS messages will be processed immediately, but as a consequence the battery will last much shorter. With the 700mA internal battery, it will only last about 10-12 Hrs.

NOTE: Expanded information on Parameter settings for Tracking and Power Save modes:

The parameter format is: T0003R020C010 (Default)

Password-I-TRK-TxxxxRxxxCxxx **Example: 1234-I-TRK-T0003R020C010**

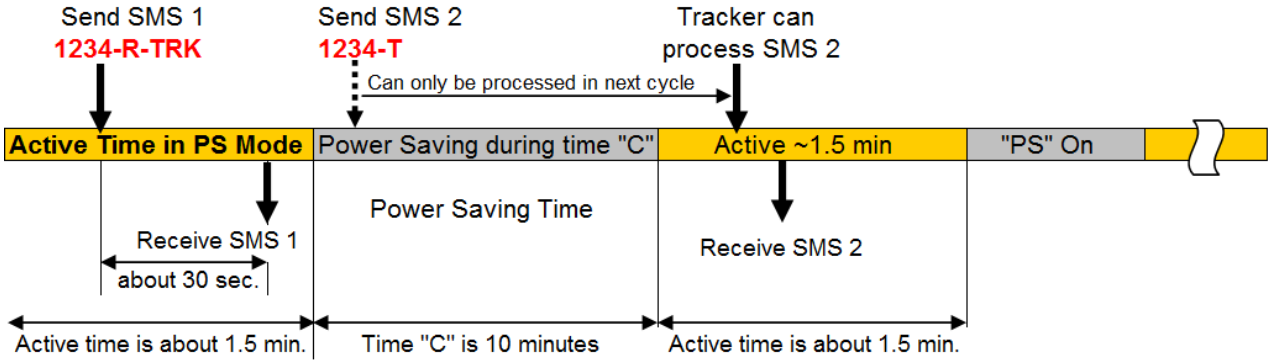


The first block in this string indicates the time between position reports for theTracking Mode. The default time between transmitted SMS containing the GPS data is 3 minutes. This time can be changed to a number between 3 to 9999 minutes. For example if you want a SMS with updated GPS information every 30 Minutes while it is in Tracking mode, it should be set as T0030.

The second block indicates the number of repeated position messages. When this number is reached the tracker will stop the Track-Mode. Default in Track Mode is R020 and can be changed to any number from 1 - 999. If this number is excessive, it may be too large for the battery life.

The third block is only applies if the device is operating from the internal battery, and with Power Save mode ON. It indicates at what time intervals the tracker will check if a SMS was sent with a new instruction. This is also valid if the time interval between GPS position data is large while it is in Tracking mode. The condition to have a check between GPS data messages when tracking mode is active, is T >2C.
The time can be set between 3 - 999 minutes

9.2 Power Save Mode-ON. Operating from internal battery only, with NO external power connected:



In above example a message **1234-R-TRK** is sent in the active Time (about 1.5 min.) of the Tracker and a response message will normally be received in about 30 seconds. (Depending on the mobile network provider)

The second SMS command **1234-T** can only be processed in the next active time after the Power Save period, and the entire device is turned off for 10 minute periods (Or whatever the "C" time is required by the user).

NOTE: If the "T" time in the Track mode is set to <10 min the tracker will be able to receive instruction SMS messages directly for the time T x R. If time is >10 min the tracker will go into Power Savings (PS) and a SMS sent in that period will only be processed after the check time "C" is finished. See example above.

NOTE: Before switching to PS mode ON it is advised to run the tracker in PS - mode OFF for about 15 minutes to allow the tracker to build-up the Ephemeris and Almanac of the satellites and after all new parameters are changed to your preferred settings.

NOTE: For a general idea of how Power saving mode saves battery life, when a SMS is sent with GPS coordinates every 15 min (e.g. Tracking mode activated with a "T" time of 15 min), the internal battery will last about one week. Depending on other parameter settings the battery life could even last for months.

9.3 External power connected with Power Save Mode-ON: (TRC0078 only)

The device will be able to receive SMS messages at all times, and they will be processed immediately while within the GSM reception area. Other features, like the internal GPS, goes into standby mode to save the battery power of the external power source. It will be activated by the required mode you want to pre-program. Example – Motion sensor ON and Power save ON: The tracker will be able to receive SMS commands at all times, but will only switch on the GPS when motion is detected, or when you request GPS position.

NOTE: It is important to note that there is a difference in how the Power Save feature works, depending on if it is connected to an external power source, or if it is only operating from the internal battery. If connected to an external power source, the device will be able to receive new SMS commands at all times. In other words, the "C" timing is not valid at all, as the GSM feature remains permanently active in this case.

If operating ONLY from the internal battery, then the device will not be able to receive new SMS commands while it is in standby during the "C" times programmed if Power Save is ON.

10. Track Mode

Command String: <Password>-T for Track Mode **example: 1234-T**

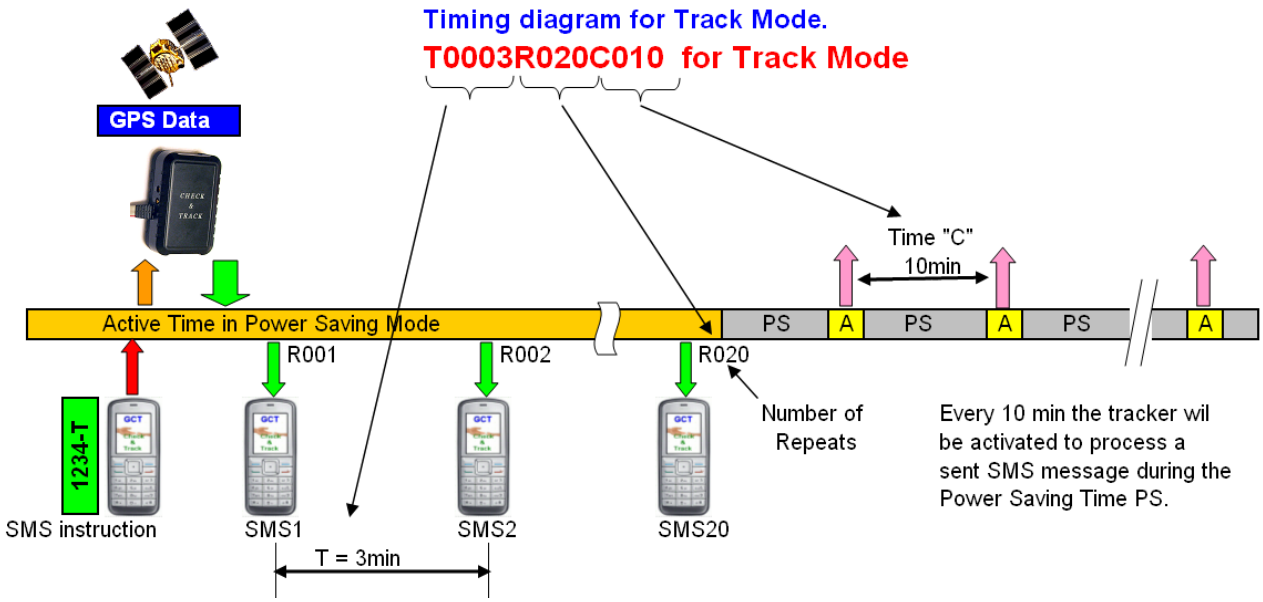
The Track Mode is important in cases where a regular position check is important, for example, when your vehicle is stolen and you want to track its route. Track mode is also activated by the Motion sensor, or by geofencing if required.

The Default programming settings are: **T0003R020C010**

The meaning of these parameters are as follows:

T = Time between each SMS message with GPS coordinates that the device will send while it is in the "Tracking" mode.
R = Number of times the GPS position SMS messages is sent while in "Tracking" mode.
C = This is the time delay between Checking for any new SMS messages when operating from the internal battery only, and in Power Save mode.

10.1 Power Saving Mode ON, internal battery only:



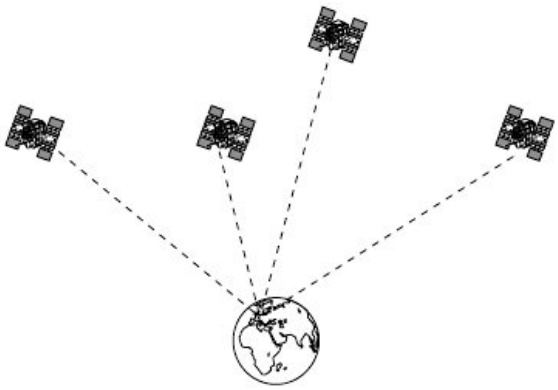
10.2 Power Saving Mode OFF:

If the Power Saving Mode is switched OFF the tracker will always be in an active state. This means that the GPS coordinates will be available as in warm stage within about 12 seconds. The parameters for T and R are still valid and can be set according your own requirements. The parameter "C" however is not valid any more.

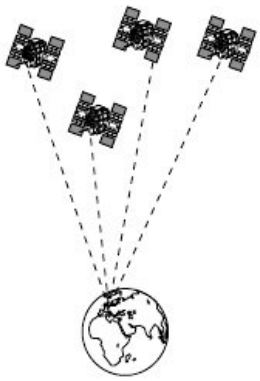
11. GPS accuracy and time to Fix and SMS Delays

11.1 Accuracy

Place the tracker in a position to allow the best possible open sky view. Obstruction can affect the time and accuracy of the GPS data. The accuracy of the GPS position depends on a number of factors. First of all, the number of satellites from which signals can be received by the tracker. More satellites will give a better accuracy. The number of the satellites received is an important factor.



1- Better Accuracy



2 - Less accurate

Further more, a clear sky view will give better results than a sky view which is obstructed by buildings and/or trees. Accuracy according reception of signals as shown in picture 1 can sometimes be within a few meters.

11.2 Time to Fix, Time of acquisition of GPS data

Apart from the points listed under 11.1, the time of a 2D or 3D fix depends on the received signal strength of the satellites. It is therefore important not to put obstacles between the tracker and the open sky. For example, a thick jacket over the tracker will influence the sensitivity and will result in longer times to acquire the satellite data. In normal operation condition the time for 3D Fix is around 40 seconds(Cold start) and between 6-20 sec. in a “warm” start condition.

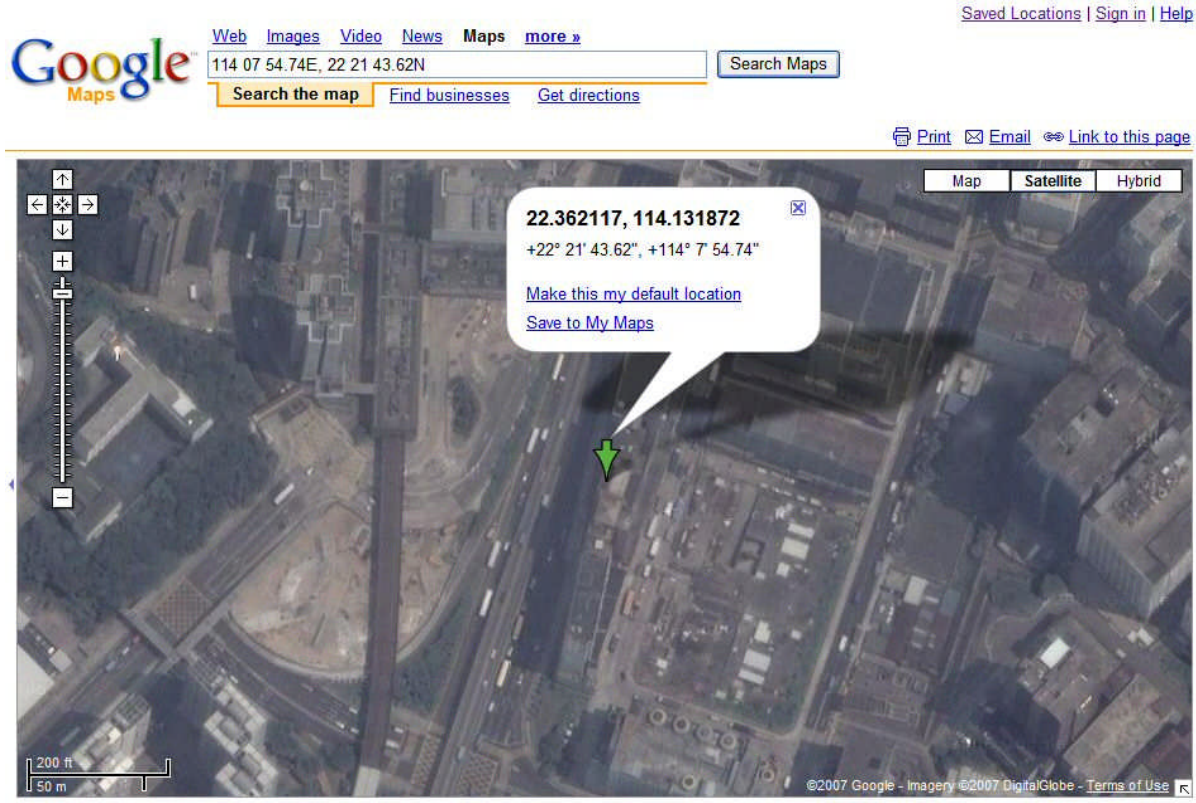
11.3 Time delays due to GSM Network congestion

Depending on the GSM network traffic, SMS instructions and/or data transfer can be very quick. However, due to heavy traffic congestion these messages can sometimes be delayed. It is recommended if this kind of delay happens to wait for awhile before resending a SMS message.

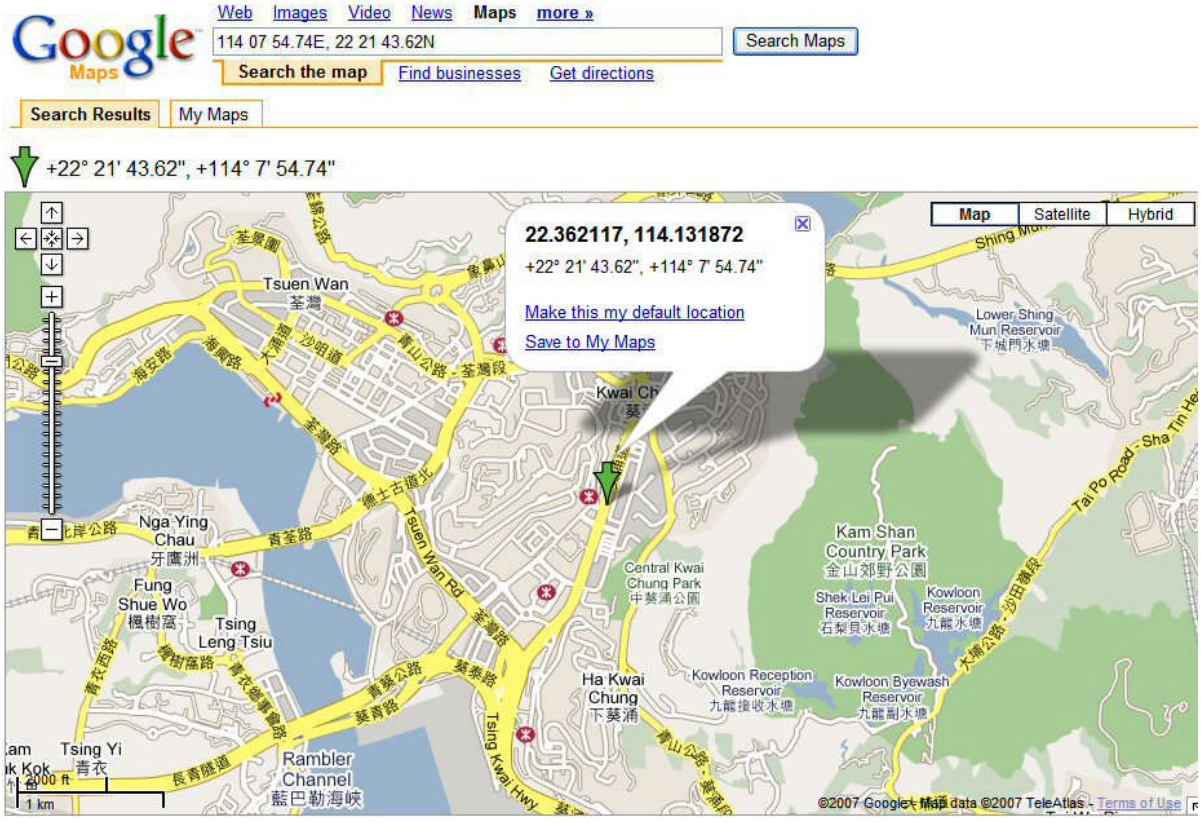
It is strongly recommended to use SIM cards in your mobile phone and tracker from the same telephone company to avoid latency in the SMS handling. Messages between different network providers are handled differently and can sometimes cause excessive delays. When very long latencies occur please contact the supplier for special settings to minimize this problem

12. Examples on how to put the coordinates in a Map program

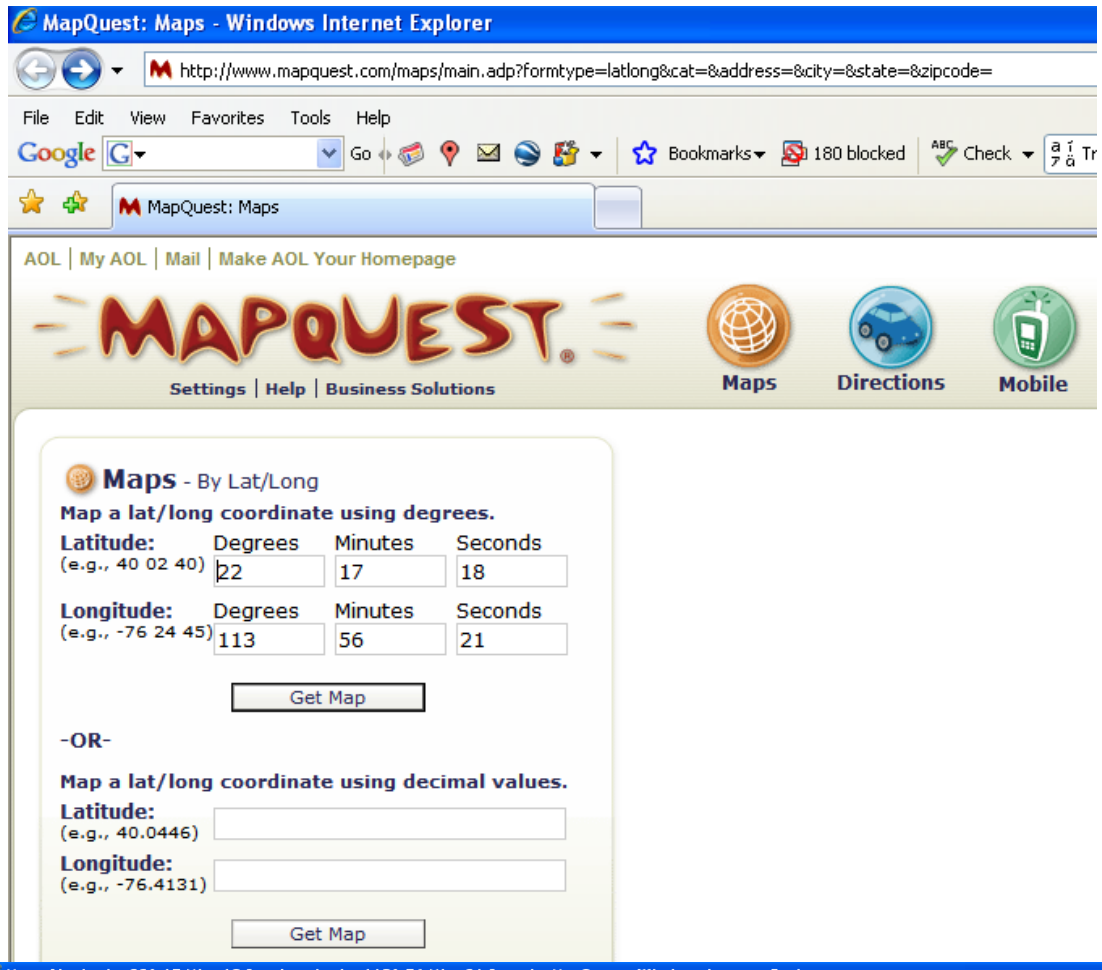
12.1 Google Maps (Satellite Image) Input via Degrees-Minutes-Seconds

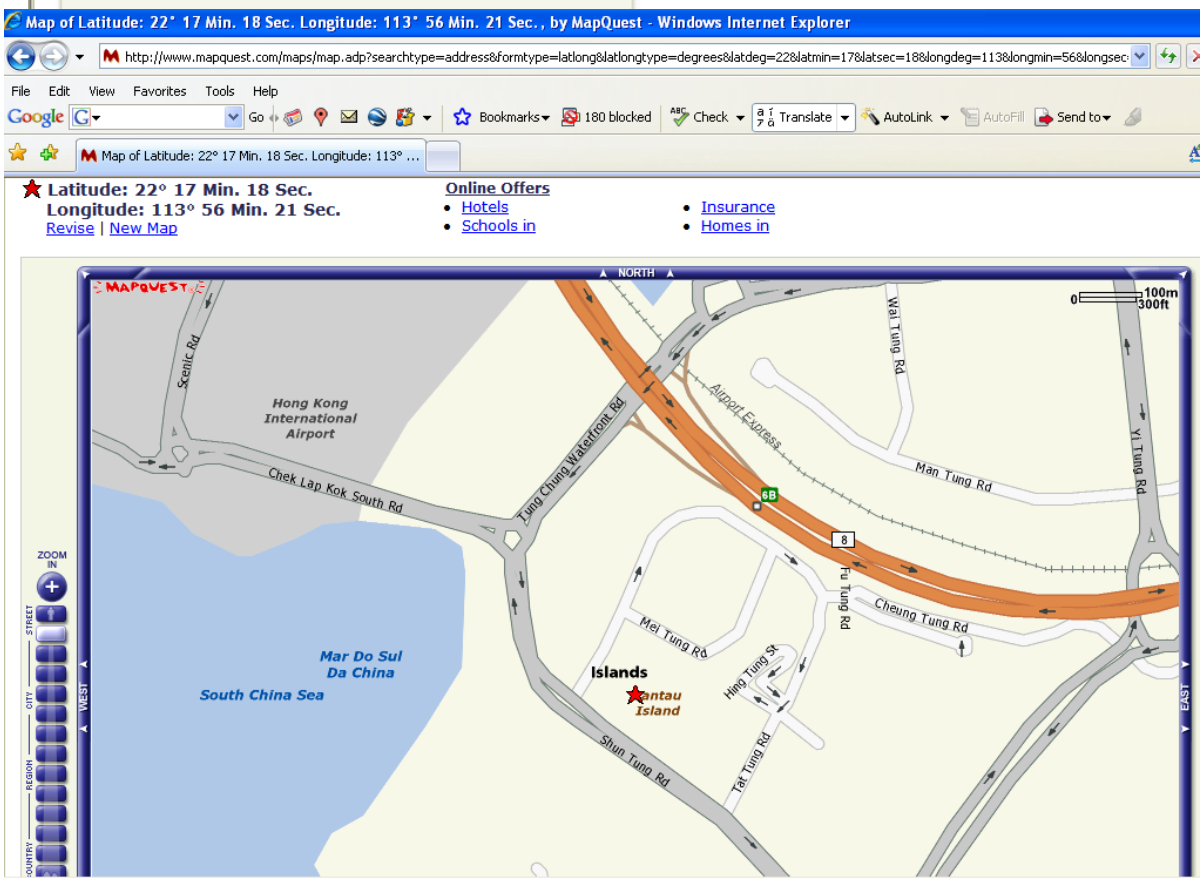

Saved Locations | Sign in | Help
Google Maps
Web Images Video News Maps more »
114 07 54.74E, 22 21 43.62N
Search Maps
Search the map Find businesses Get directions
Print Email Link to this page
Map Satellite Hybrid
22.362117, 114.131872
+22° 21' 43.62", +114° 7' 54.74"
Make this my default location
Save to My Maps
200 ft
50 m
©2007 Google - Imagery ©2007 DigitalGlobe - Terms of Use

12.2 Google Maps Input: Degrees-Minutes-Seconds



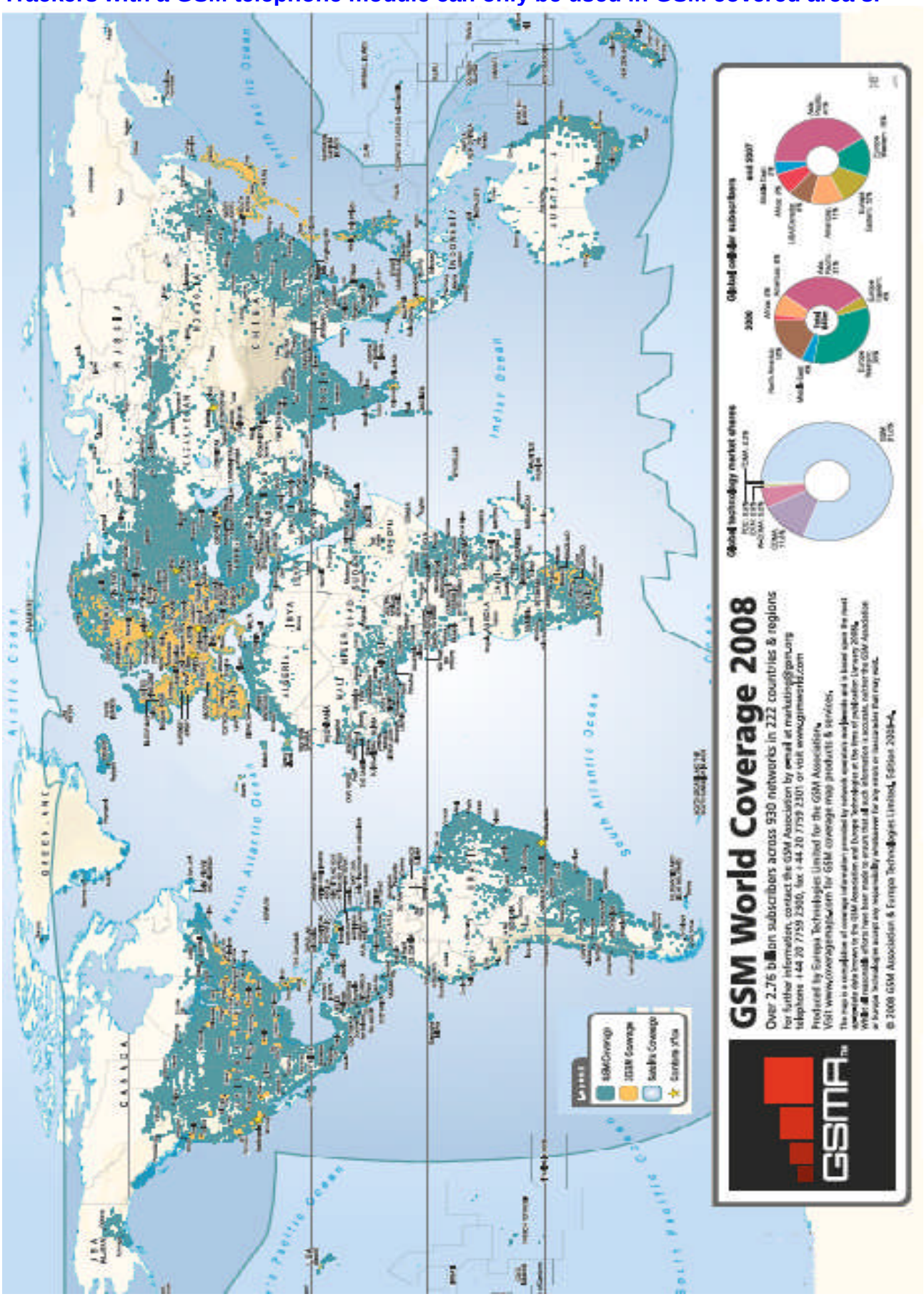
12.3 MapQuest input: Degrees, Minutes, Seconds or degrees decimal


MapQuest: Maps - Windows Internet Explorer
http://www.mapquest.com/maps/main.adp?formtype=latlong&cat=&address=&city=&state=&zipcode=
File Edit View Favorites Tools Help
MapQuest: Maps
AOL | My AOL | Mail | Make AOL Your Homepage
MAPQUEST
Settings | Help | Business Solutions
Maps
Directions
Mobile
Maps - By Lat/Long
Map a lat/long coordinate using degrees.
Latitude: (e.g., 40 02 40) Degrees 22 Minutes 17 Seconds 18
Longitude: (e.g., -76 24 45) Degrees 113 Minutes 56 Seconds 21
Get Map
-OR-
Map a lat/long coordinate using decimal values.
Latitude: (e.g., 40.0446)
Longitude: (e.g., -76.4131)
Get Map



13. GSM Coverage of the World

Trackers with a GSM telephone module can only be used in GSM covered area's.


GSM World Coverage 2008
Over 2.76 billion subscribers across 930 networks in 222 countries & regions
for further information, contact the GSM Association by email at marketing@gsmworld.com
telephone +44 20 7759 2300, fax +44 20 7759 2301 or visit www.gsmworld.com
Produced by Europa Technologies Limited for the GSM Association.
Visit www.coveragemaps.com for GSM coverage map products & services.
GSM
GSMA

14. QUICK demo to get acquainted with the unit

1) **Install a SIM card in the unit and write down the number.**
Ensure **no** PIN number is set and that card is activated and disable call-forwarding and voice mail messaging. Initially activate the SIM card for the first time with a normal mobile phone.

2) **Install the battery in the unit**. Connect the battery wires to the connector on the PCB. Put the tracker on a place for a clear sky view.

3) **Type and Send SMS: 1234-R-TRK** to your tracker mobile phone number and you should get information about the settings of the Track Mode.

4) **You will Receive a SMS after about 30-45 seconds like: TRK: T0003R020C010**

5) **Type and Send SMS: 1234-S** This command will instruct the tracker to send one single (S-single) GPS coordinates position.

6) You can expect to receive a SMS back with data like the message shown below:
Single Mode

Lon 114* 7' 58.895"E	Longitude coordinates
Lat: 22* 21' 42.816"N	Latitude coordinates
Height: 85.5m	Height above sea level
LOC 07:58:23	Local Time, or UTC time
10-01-2008	Date-month and year

7) **Send SMS: 1234-M-ON**
This command will switch the motion sensor ON.
You will to receive a SMS back "**Motion sensor is switched ON**"

8) **Shake the Tracker:**
The motion sensor will trigger the tracker and it will send the message "**Motion Alert**".
Wait about 30 seconds and shake it again.
You will receive a SMS "**Vehicle is moving**".
This will switch the tracker automatically in Track-Mode and you will receive SMS messages similar to that listed above under point **6**, however the indication will be **Track Mode.** This will continue until the unit is stationary for some time, or reaching the number of repeats (R020) or until you switch off the Track mode.

9) **Send SMS: 1234-T-OFF**
This command will switch the Track-Mode OFF.

10) **Send SMS: 1234-M-OFF**
This command will switch the Motion Sensor OFF.

11) **Send SMS: 1234-I-SOS1-xxxxxxxx** xxxxxxxx= Phone number of party to be informed if emergency occurs. Number should be +country code, area code, phone number. After sending above message the party will receive confirmation message that in emergency cases she or he will received GPS coordinate information. The sender will receive confirmation message like SOS1: xxxxxxxxxx to confirm the set number. Then press the SOS button on the Tracker and a moment later the party will receive the SMS message "Emergency" + the GPS coordinates.

12) **Send SMS: 1234-I-SOS1-0** to erase the number. You will receive confirmation SMS with Info "**SOS1 Erased**".

13) **Send SMS: 1234-I-D**. This command will re-set the tracker back to the Default settings.

15. General SMS string information and command structure

"Security code" - "Mode" - "Subgroup1" - "Subgroup2"

Instuctions & Request functions (I & R) in <**Mode**> block. All commands have to be preceded by the security code.

Mode	Subgroup1	DESCRIPTION
I	**SEC**	To change security code (Password)
I & R	**TRK**	Track mode to set/request time "T" between GPS information transmissions and number of repeats "R" and set SMS Check time "C"
I & R	**GPS**	To set/request the tracker to us the specified data format like **DMS** (degrees, minutes, seconds), **GOOGLE** (URL for Google Maps), **DDEC** (degrees decimal) or a NMEA data line(GPGGA-GPGSA-GPRMC)
I & R	**GEO**	To set or request the Geofence settings.
I & R	**TEL**	Will direct the tracker to use another telephone number to send requested data overriding the default caller ID
I & R	**SOSxxxxx**	Set-up or Request SOS numbers (max 8 numbers can be stored)
I & R	**LOx**	To activate or request Line-out status. (Only for TRC0078)
I & R	**APN**	Set or Request the access point name for GPRS function.
I & R	**IP**	Set or Request the Internet Protocol address for GPRS function.
I & R	**UN**	Set or Request the User Name for GPRS access.(only if needed)
I & R	**PW**	Set or Request the Password for GPRS access.(only if needed)
I & R	**PORT**	Set or Request the Port Number for GPRS access.
R	**SMSxxxxx**	To recall up to the last 8 transmitted SMS messages (1-8) incl. Caller ID, a SMS command request without number will send all 8.
R	**M**	Request setting if motion sensor is switch ON or OFF
R	**Version**	Request for information about software version in the tracker
R	**IMEI**	To get the IMEI numbers of the GSM module
R	**GPRS**	Request the GPRS settings, APN, IP ,name, password
R	**BAT**	Request battery status SMS will be sent indicating internal battery voltage
I	**D**	Will change all settings back to factory default settings.

Direct commands in "Mode" block:

Mode	Subgroup1	DESCRIPTION
S		Set Tracker in Single mode. One position data will be sent.
T		Set Tracker in Track mode. Tracker will send repeated position data. Default setting is T0003R020C010 meaning every 3 minutes for 20 times a message will be sent and every 10 minutes a check will be carried out if new instruction message(SMS) was sent.
Last		Tracker will send LAST valid GPS data
GEO	**ON/OFF**	To switch the GEOFENCE function ON or OFF. (Default is OFF)
M	**ON/OFF**	To switch the Motion sensor ON or OFF. (Default is OFF)
LOx	**ON/OFF**	To switch the number x Line-out ON or OFF. (Default is OFF) (TRC0078 only)
PS	**ON/OFF**	To switch the Power Saving mode ON or OFF. (Default is ON)

<Subgroup2>	Instruction information like: Telephone numbers; settings of **T**, **R** and **C**; data format for GPS information (**DMS**, **Google**, **Ddec**, NMEA, GPGGA-GPGSA-GPRMC) etc.

16. Command and Instruction List for SMS messages

16.1 Initialization & Set-up commands

MODE	Command	Feedback SMS (Instructed telephone)
Initialization Mode or Set-up mode [I]	Security code-I-SEC-New security code	Your new Password is: xxxxxxxxx
	Security code-I-GPS-DMS	GPS:DMS
	Security code-I-GPS-Google	GPS:GOOGLE
	Security code-I-GPS-Ddec	GPS:DDEC
	Security code-I-GPS-NMEA-GPRMC	GPS:NMEA GPRMC
	Security code-I-GPS-NMEA-GPGGA	GPS:NMEA GPGGA
	Security code-I-GPS-NMEA-GPGSA	GPS:NMEA GPGSA
	Security code-I-TRK-TxxxxRxxxCxxx	TRK:TxxxxRxxxCxxx
	Security code-I-CHK-TxxxxRxxxCxxx (TRE0078 only)	CHK:TxxxxRxxxCxxx
	Security code-I-TEL-x (x=max 16digits)	GPS coordinates will be sent to x
		TEL x failed please check the number
	Security code-I-SOS# -phone number (max 16)	SOS#: X
		SOS X failed please check the number
	Security code-I-SOS# -0	SOS# Erased
	Security code-I-GEO-xx (xx = 1-99)	GEOFENCE is set to XX00m
	Security code-I-GEOUP-xxx (xxx = 1-999) (TRE0078 only)	GEO Update is set to xxx minutes
	Security code-I-GEOUP-D (TRE0078 only)	GEO Update is set to time T of Track-Mode
	Security code-I-CSTANDBY-xxx (xxx=2-255)	SMS check time is set to xxx minutes
	Security code-I-CSTANDBY-D	SMS check time is set to default time
	Security code-I-APN-xxxxxxx	APN:xxxxxxx
	Security code-I-IP-xxxxxxx	IP:xxxxxxx
	Security code-I-UN-xxxxxxx	UN:xxxxxxx
	Security code-I-PW-xxxxxxx	PW:xxxxxxx
	Security code-I-PORT-xxxxxxx	PORT:xxxxxxx
	Security code-I-D	SOS1: GPS:DMS TRK:T003R020C010 CHK:T1440R007C030 (TRE0078 only) TEL:

16.2 “Request” Commands

MODE	Command	Feedback SMS (Instructed telephone)
Request Commands [R]	security code-R-SMSx X:1-8 (TRE0078 only) security code-R-SMS (TRE0078 only)	stored message X SMSx No Message
	security code-R-SOSx X = 1-8 security code-R-SOS	all stored messages SMS1 No Message SMS2 No Message SMS3 No Message SMS4 No Message SMS5 No Message SMS6 No Message SMS7 No Message SMS8 No Message
		SOSx: ********** Please set up SOSx number SOSx: SOS1: ********** SOS2: SOS3: SOS4: SOS5: SOS6: SOS7: SOS8: Please set up SOS number
	security code-R-GPS security code-R-TRK security code-R-CHK (TRE0078 only) security code-R-TEL security code-R-LAST security code-R-CSTANDBY	GPS:xxx TRK:TxxxxRxxxCxxx CHK:TxxxxRxxxCxxx TEL:x LAST VALID GPS SMS check Time is set to xxx minutes
	security code-R-GEO security code-R-GEOUP (TRE0078 only)	GEOFENCE is set to X00m GEO Mode is switched ON/OFF GEO Update time is set to xxx minutes GEO Update time is set to T of Track Mode
	security code-R-M security code-R-BAT security code-R-PS security code-R-VERSION security code-R-IMEI	Motion sensor is switched ON/OFF VOLT : x.xxV Power save mode is switched ON/OFF Version : Model# yymm or mmdd IMEI : xxxxxxxxxxxxxxx
	security code-R-GPRS	GPRS:ON/OFF APN :XXXXXXXX UN:XXXXXXXX PW:XXXXXXXX I P:XXX.XXX.XXX.XXX TCP@XXXX

16.3 Basic Commands

MODE	Command	Feedback SMS(Instructed telephone)
Single GPS request mode S	[security code]-[S]	Single Mode GPS data Single Mode GSM Node Lac:XXXX Ci:XXXX LOC(UTC) hh:mm:ss dd-mm-yyyy
Tracking Mode T	[security code]-[T]	Track Mode GPS data
		Track Mode GSM Node Lac:XXXX Ci:XXXX LOC(UTC) hh:mm:ss dd-mm-yyyy
		Stationary Position (TRE0078 only) GPS data
		Stationary Position (TRE0078 only) GSM Node Lac:XXXX Ci:XXXX LOC(UTC) hh:mm:ss dd-mm-yyyy
	[security code]-[T]-[OFF]	T:OFF
Checking Mode C TRE0078 only	[security code]-[C]	Check Mode GPS data
		Check Mode GSM Node Lac:XXXX Ci:XXXX LOC(UTC) hh:mm:ss dd-mm-yyyy
		GPS data GSM Node Lac:XXXX Ci:XXXX LOC(UTC) hh:mm:ss dd-mm-yyyy
	[security code]-[C]-[OFF]	C:OFF
Motion Mode (M)	[security code]-[M]-[ON]	Montion sensor is switched ON Motion Alert ! LOC(UTC) hh:mm:ss dd-mm-yyyy Vehicle is Moving ! LOC(UTC) hh:mm:ss dd-mm-yyyy
	[security code]-[M]-[OFF]	Montion sensor is switched OFF
Last	[security code]-LAST	LAST VALID GPS GPS Data
GEO mode	[security code]-[GEO]-[ON]	GEO:ON GPS Data Geofence can not be set at this time, please try later again Exit Boundary GPS Data Enter Boundary GPS Data
	[security code]-[GEO]-[OFF]	GEO:OFF
PS mode	[security code]-[PS]-[ON]	POWER SAVE Mode switched ON
	[security code]-[PS]-[OFF]	POWER SAVE Mode switched OFF

Basic Commands continue

MODE	Command	Feedback SMS (Instructed telephone)	Feedback SMS (Redirected telephone)
SOS Button	With SOS setting		EMERGENCY GPS data EMERGENCY GSM Node Lac:XXXX Ci:XXXX LOC(UTC) hh:mm:ss dd-mm-yyyy
	Without any SOS setting	Please set up SOS number GPS data Please set up SOS number GSM Node Lac:XXXX Ci:XXXX LOC(UTC) hh:mm:ss dd-mm-yyyy	
SOS	[security code]-[I]-[SOSx]-{xxxxxx}	SOSx:xxxxxxxx	You will receive GPS coordinates in case of emergency
Extra information to GPS data for TRC0078 models		LI1-LOW LI2-LOW LI3-0% LI4-0% LO1-OFF LO2-OFF	LI1-LOW LI2-LOW LI3-0% LI4-0% LO1-OFF LO2-OFF
TRC0078 only **Line output mode (LOx)**	[security code]-[LO]-[ON] [security code]-[LO]-[OFF] [security code]-[LOx]-[ON] X: 1-2 [security code]-[LOx]-[OFF] X: 1-2	LO is active LO is not active LOx is active LOx is not active	
GPRS Mode	[security code]-[GPRS]-[ON]	GPRS:ON Can not switch on GPRS, please check the GPRS settings and Server application	
	[security code]-[GPRS]-[OFF]	GPRS:OFF	
Battery "LOW"	When voltage <3.55V Charge LED starts blinking		
	When voltage <3.4V	BATTERY LOW, LOC(UTC) hh: mm:ss dd-mm-yyyy	
	Security code-R-BAT	BATTERY LOW, LOC(UTC) hh: mm:ss dd-mm-yyyy	
Others	wrong security code-Command security code-Wrong Command The default security code : 1234	Error! Wrong Security Code COMMAND ERR	

17. GPRS FUNCTION GUIDE (Advanced feature)

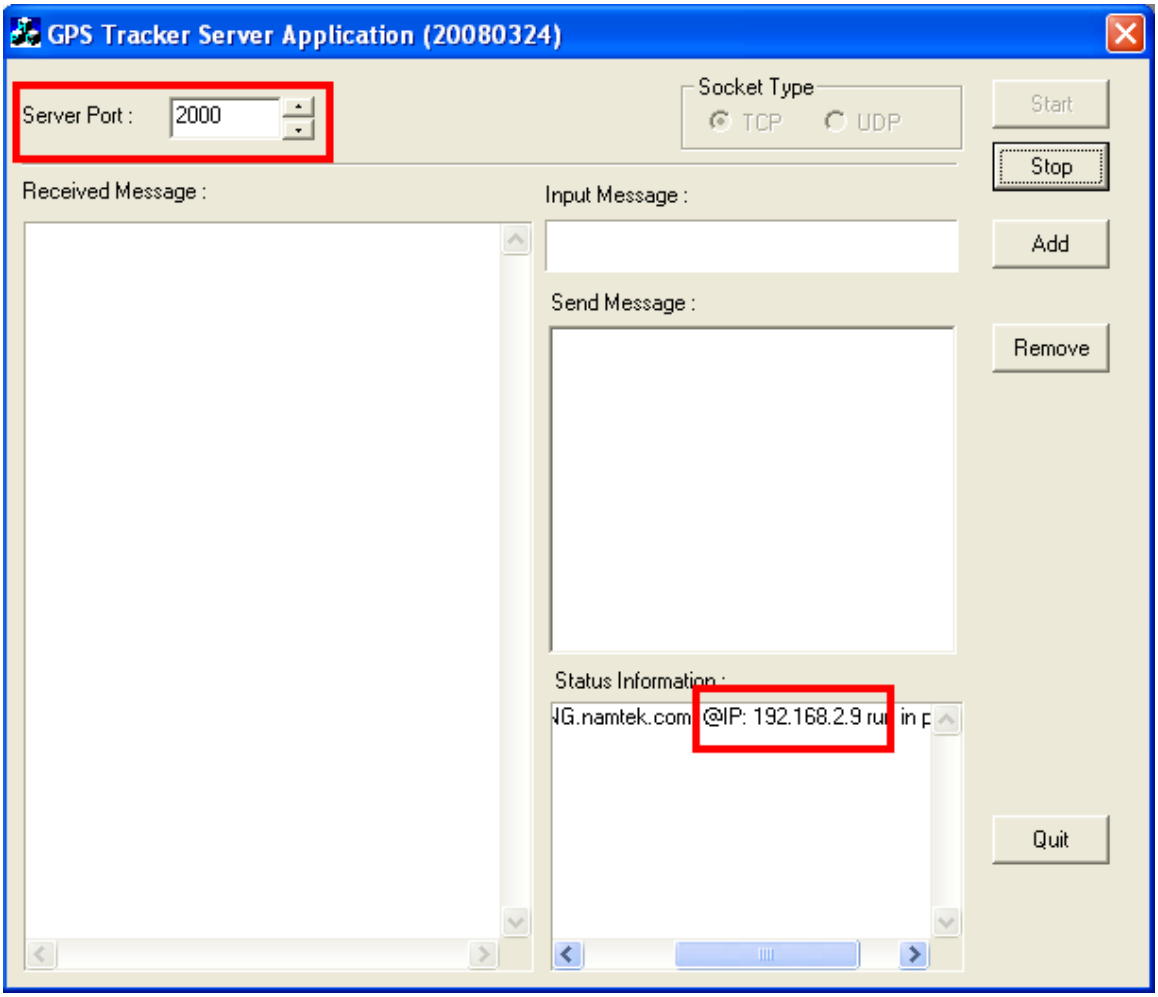
Please make sure that there is a PC with public IP address which the user can access the internet. Also please confirm the SIM card installed in the GPS tracker has GPRS capability.

17.1 Software update

If needed, update the latest software supported to GPS Tracker by USB update tool (USB programming tool.exe).

17.2 Get IP address

Run the ServerApplication.exe , click “Start” button start up server application. Server application will show Your IP address on the status editor, please note the IP address and port number for further set-up.

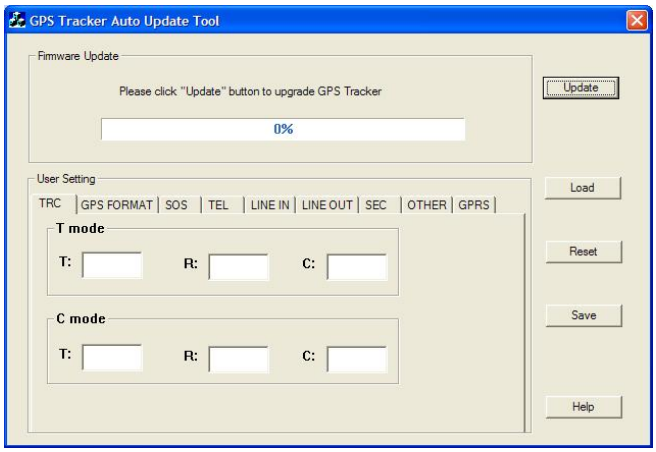


17.3 GPS Tracker configuration for GPRS

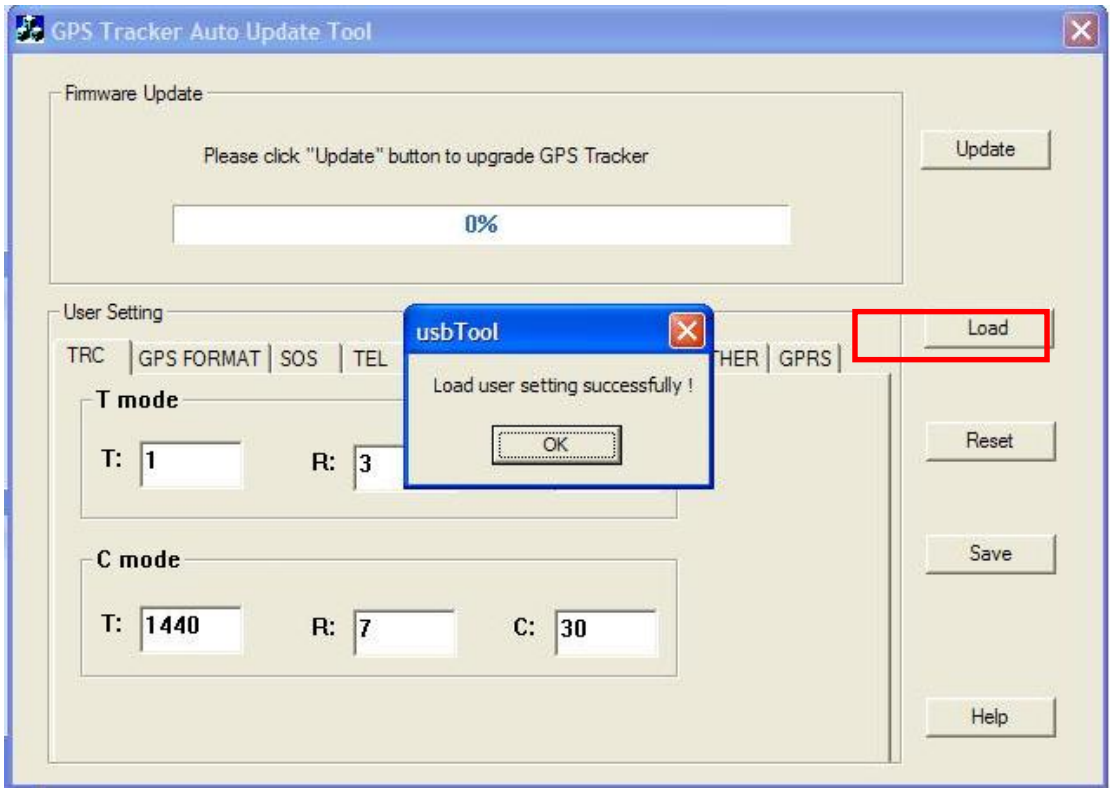
There are two methods to set up the GPS Tracker for GPRS mode.
The user can select any one of them to complete the setup:

Setup the GPS Tracker by USB:

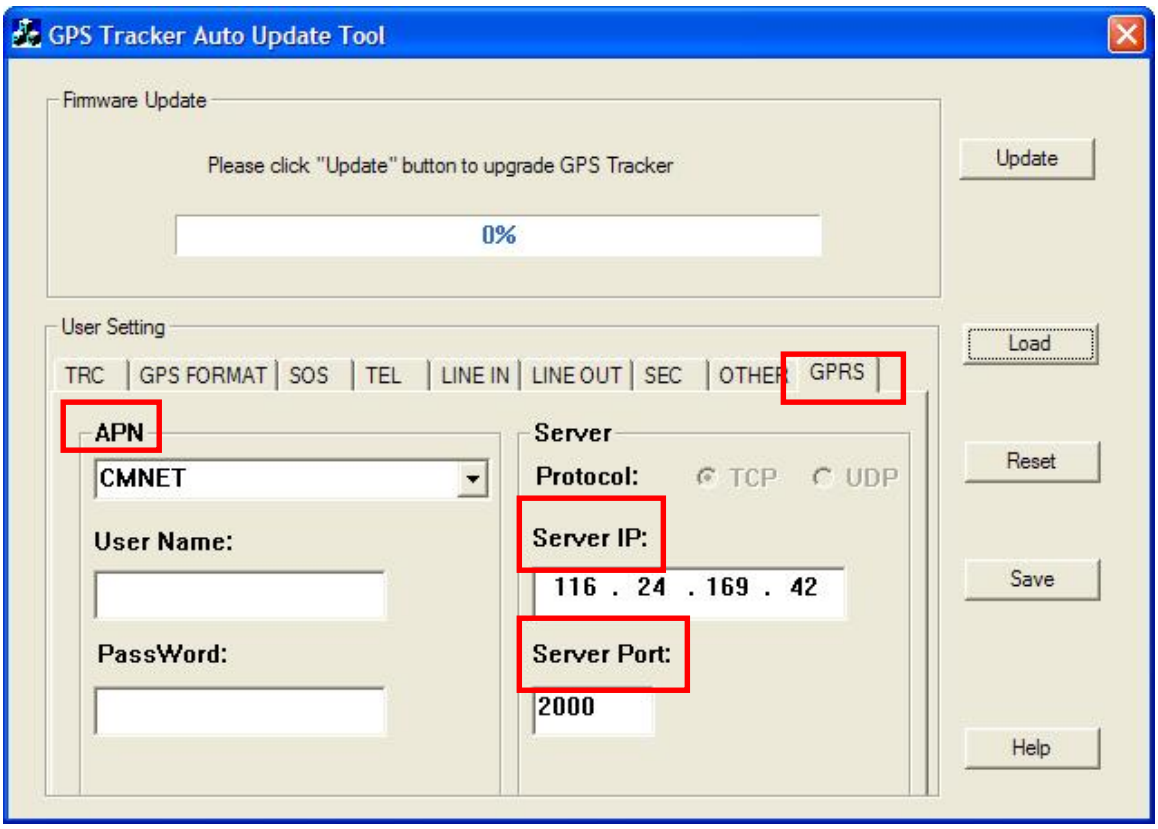
a) Connect GPS Tracker to PC with USB Cable.
b) Run the application “USB Programming Tool.exe”



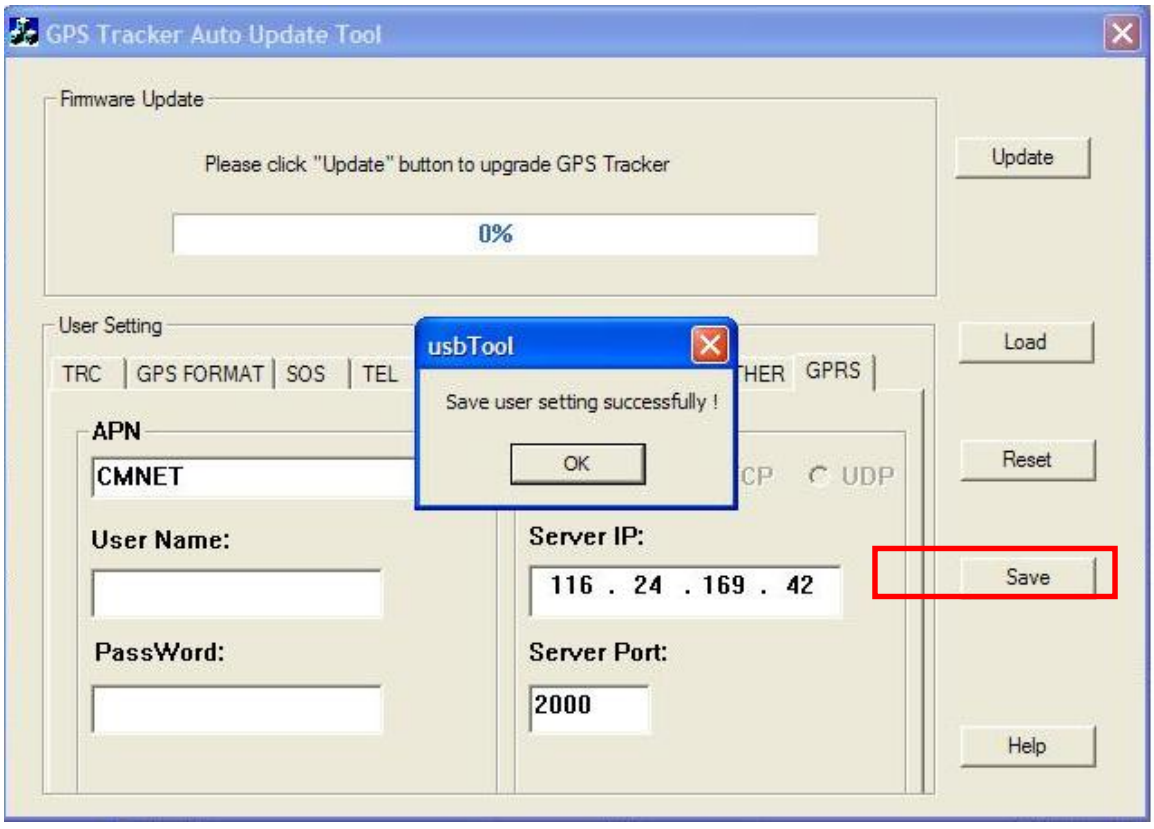
c) Click “Load” button to get user setting of GPS Tracker.



d) Click GPRS button for setting up GPRS parameter.
Set your local APN (for example CMNET in china) to APN editor
(Please set up user name and password if necessary)
Set up server IP with the IP address showed in Server application
Set Server port to 2000.
Set Server protocol to TCP.



e) Click “save” button to keep the GPRS parameters into GPS Tracker.
***Disconnect the GPS tracker from PC.
The GPS Tracker will automatically connect to Server through GPRS.



Setup the GPS Tracker by SMS:

GPS Tracker also enables the user to complete the setup through SMS.
a) Setup APN, send SMS “security code-I-APN-XXXXXXX ”,
XXXXXXX is your local APN name.
b) Setup APN username and password if necessary.
Send SMS “security code-I-UN-XXXXXXX ”,
XXXXXXX means your user name for APN.
Send SMS “security code-I-PW-XXXXXXX ”,
XXXXXXX means your password for APN.
c) Setup Server IP.
Send SMS “security code-I-IP-XXX.XXX.XXX.XXX ”,
XXX.XXX.XXX.XXX means your IP address .
d) Setup Port number.
Send SMS “security code-I-PORT-XXXXX ”,
XXXXX is the port number of Server application.
e) Start up GPRS connection.
Send SMS “security code-GPRS-ON ”, GPS Tracker will try to establish the GPRS connection according to the user setting.

17.4 Send command through server application to GPS Tracker and check the reply message.